

Sumbawa Island: From Gold Mining to Bio-Mining

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Sumbawa island has caused Emperor of France, Napoleon Bonaparte to defeat at Battle of Waterloo against UK and Prussia, the creation of the first bicycle and Frankenstein novel, when Mount Tambora which is located in the middle of the island, erupted in 1815 with VEI-7 – the biggest recorded volcanic eruption in human history – which resulted in the year without summer in 1816. Yet, just about 40 years later, Alfred Russel Wallace, an explorer from UK passed through Sumbawa Island from Malay Peninsula to Aru Island at the East and from the observation of flora and fauna of many islands he visited, proposed the theory of evolution together with Charles Darwin. These two events showed the importance of Sumbawa Island in the history mankind. Another 30 years after Wallace visit to Indonesia, the Sultan/King of Sumbawa has been able to build four stories wooden stilts palace, which still became the biggest stilts house in Indonesia up to now. The Sultan also sent many young Sumbawa to study abroad like in Mecca, Saudi Arabia to study Islamic religion etc. The prosperity of Sumbawa at that time, made them called their own land as “Tana Intan Bulaeng” or “the Land of Diamond and Gold”, although majority of income came from selling and exporting agricultural products at that time. However after Indonesian independence in 1945, and consequently the closing of the Sumbawa sultanate, Sumbawa economy and human resource quality decreased until became the 2nd lowest region in the whole modern Indonesia. In 2000, Indonesia second largest gold mine site was operated in Sumbawa Island, with current production of about 22.6 ton gold, 217 thousands ton copper per-year. There are still more than 10 gold mine sites in Sumbawa Island with permission from Indonesia Government, which are still on exploration, instead of production. Unfortunately with low human resource quality, not many Sumbawa are able to work at that gold mine company. While Sumbawa mineral rich has been exploited successfully, biodiversity abundant has never been explored seriously.

With those spirit, Sumbawa University of Technology, a private owned university, has been established, with I involved in the foundation of Biotechnology Faculty and Department. After graduated from Tokyo University of Agriculture and Technology in 2000, then worked about 10 years as researcher at various government institutions in Jakarta, Java island such as Biotechnology RnD Center of Indonesian Institute of

Sciences, and RnD Division of Dharmais Cancer Hospital/National Cancer Center, and Division of Allergy and Clinical Immunology, Faculty of Medicine, the University of Indonesia, as well as taught and supervised at bachelor, master and PhD degrees in almost all best universities in Indonesia at various Departments and Faculties such as Medicine, Food Technology, Biology, Chemistry, Physics, I found Sumbawa island was an attractive challenge to explore, following the path of Wallace but with new tools namely biotechnology. I prepared first from human resource, besides regular academic teaching, we also sent students to US and Japan for competition and internship, then young lecturers to study Master and PhD degrees to Japan, the Netherlands, UK, and Sweden. With those achievements, we were able to obtain Technopark National Program by which we were able to prepare lab building and equipment. So, when our lecturers finished their PhD around next year, they will have no difficulties in access to required facilities.

Sumbawa island is part of Wallace hot spot, rich in flora and fauna diversity which different with West part of Indonesia including Java, Borneo and Sumatera islands. Komodo Island, a UNESCO World Heritage is our neighbor in the east, while famous tourist site Bali Island is to the West. It is also part of Coral Triangle, where majority of coral and coral fish species exists. Among 7 species of living turtles, 5 are living in ocean surround Sumbawa Island. Thus in term of biodiversity, it is a very unique region, which already attract international communities. For example, UK's Kew Gardens just received grant from Newton Fund to explore Sumbawa forest plants. The initiator and operator of the world largest shrimp farm in Lampung, Sumatera Island, now moving their business to Sumbawa Island due to clarity of the sea water. With the availability of highly educated staff and sufficient equipment, moving on Sumbawa from gold-mining to bio-mining may not just a dream anymore. Thus, we invite you to join this endeavor to follow the path of great Alfred Russel Wallace.

Biomedical Engineering

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Biomedical engineering (BME) is a fast-growing, interdisciplinary field that integrates engineering, mathematics, medicine, and science to improve human health and quality of life (<https://www.bme.unc.edu/about/>). Our BME joint department, is a unique collaboration between North Carolina's two flagship universities: The University of North Carolina at Chapel Hill and North Carolina State University. The nationally ranked UNC Hospitals and School of Medicine at UNC-Chapel Hill provide an excellent clinical environment for students to gain experience in medicine, while the College of Engineering at NC State, one of the finest engineering and computer science schools in the world, offers state-of-the art facilities for students and faculty engaged in vital areas of research and technology transfer. In this seminar, I will introduce our innovative, collaborative, translative research environment and activity in BME, together with attractive, friendly, hassle free campus and neighbor at North Carolina for your future and potential research opportunity.